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IMPLEMENTATION AND EFFECTS OF A PROFESSIONAL ALL-VOLUNTEER ARMY FROM MAINTENANCE VIEWPOINT

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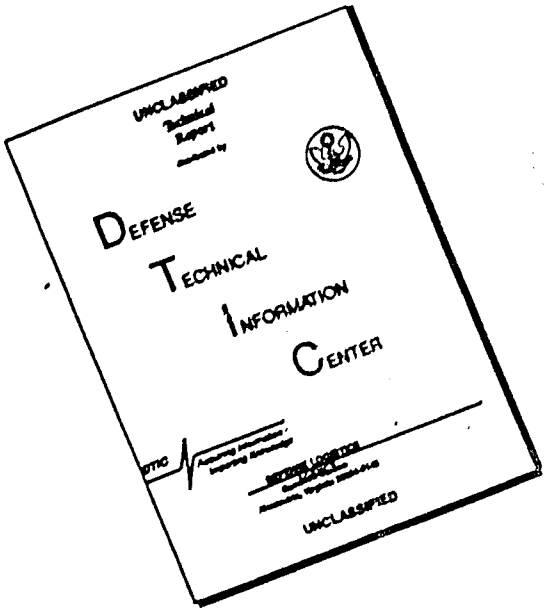

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Maintainability

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FOREWORD

The research discussed in this report was accomplished as part of the Maintainability Engineering Graduate Program conducted jointly by the USAMC Intern Training Center and Texas A&M University. As such, the concepts, and results herein presented are those of the author and do not necessarily reflect approval or acceptance by the Department of the Army.

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ABSTRACT

Research Performed by William P. Neal

Under the Supervision of Dr. R. L. Street

This paper is intended to explore major problem areas in the implementation of a professional, all-volunteer army from the standpoint of the maintenance environment. In addition, several brief conclusions are presented of the benefits to the Department of the Army should a modern, professional maintenance force be successfully created.

Examination of basic psychological and managerial philosophy revealed that the organizational structure of the Army and motivational factors of personnel are sources of a great many problems the Army is encountering in personnel satisfaction, performance, and retention.

Due to the complexity of the subject matter involved, no detailed solutions to the many perplexing problems are offered. Rather, some suggestions are offered, some conclusions are drawn, and some possible benefits are mentioned. The paper is intended to be an overview, and a great deal of precise study in the various areas mentioned within is needed.

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During the course of this work, the author was employed by the US Army as a career intern in the AMC Maintainability Engineering Graduate Program. He is grateful to the US Army for the opportunity to participate in this Program.

The ideas, concepts, and results herein presented are those of the author and do not necessarily reflect approval or acceptance by the Department of the Army.

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CHAPTER I

INTRODUCTION

VOLAR, the new all-volunteer army concept, in conjunction with higher pay and incentives for increasing voluntary enlistments and retention rates, will result in far greater numbers of career orientated enlisted personnel in the Army. These new plans will have a broad impact on today's army. Changes in the organizational structure from the top to to the bottom, elimination of some degrading duties and harassment, re-evaluation of the relationship between officers and enlisted personnel, and greater promotional opportunities are some of the effects a professional all-volunteer army will have. The purpose of this paper is to investigate, using basic psychological and management principles, some major factors dictating needed changes in the Army structure, from the standpoint of maintenance. Some recommendations for change are also suggested, and resulting benefits to the Army are discussed.

Practically all texts and instructions written concerning design for maintainability stress the lack of skilled maintenance personnel in the lower echelon repair areas. Little more than preventative type maintenance is performed at the company level due to the type of personnel encountered, and the lack of skilled career orientated individuals. Equipment is being designed with this view of first level maintenance in mind. Consider the typical maintenance technician described in AMC Pamphlet 706-134, Maintainability Guide for Design (1970). According to this Army

document, the army maintenance technician should not be required to: (a) read at higher than the ninth grade reading level; (b) perform arithmetic calculations, even simple addition and subtraction; (c) consolidate or integrate information from multiple sources; (d) collect, process, or report any unnecessary or complicated data; (e) post data from one form to another or keep any permanent records.

With this view of the maintenance technician in mind, it is little wonder the maintainability engineer is required to design for a great amount of redundancy, provide for high modularization, and include sometimes excessive built-in test equipment. All this may result in much higher system costs. The new enlistment concept can have broad impact on system maintenance and design for maintainability, since acceptance standards for maintenance technicians can be increased as the military job begins to more closely resemble the civilian job. Several areas of impact are discussed below, and these suggest further investigation.

If a large number of the higher ability group of available VOLAR personnel are injected into the maintenance area, it would be possible to restructure the present army maintenance system from four to three levels, with greater emphasis on the lower levels. This may in fact be necessary, as sufficient maintenance personnel may not be induced into the army system to man four levels of maintenance. There could be more reliance on civilian workers, but there are some dangers in this.

In order to provide sufficient incentive to the organizational maintenance man to make him want such a career, more responsibility will have to be placed with him. As he progresses, he will be better trained and have greater skills, hence present company level and organizational maintenance allocations would offer little challenge to such a person. Higher

levels and more challenging maintenance activities should, therefore, be placed in the lower repair echelons in order to present sufficient difficulty, responsibility, and diversification to all maintenance personnel and to prevent, as much as possible, boredom of personnel.

With increased diagnostic and repair skills and facilities in the lower levels of maintenance, there would be an impact on maintainability design and repair parts policy. For instance, with higher maintenance skills in the field, there would exist the possibility of field repair of larger or more expensive modules of a particular system, resulting in the elimination or reduction of the requirement for providing spares for all modules of the system. New systems could be designed from the maintainability point of view to incorporate the greater repair capability in the first levels of maintenance. System availability would be affected by the broader first level repair activities. Practically all aspects of mean time to repair would be affected. Administrative, logistics, and transit times and delays could be reduced, and actual repair time would also be affected. The result is a reduction of total down time, thus increasing availability. More skilled personnel and sophisticated techniques would also affect reliability and parameters such as operational readiness.

Considerations for the implementation of a professional maintenance force are developed in following chapters. However, Chapter II is a survey of the literature concerning VOLAR. There have been only limited materials of an unclassified nature concerning detailed aspects of implementation, but brief mention of some of the more interesting publications is made.

Successful creation of an all-volunteer army will depend on the

Army's ability to generate greater interest and satisfaction among the officer and enlisted ranks, as this is the key to retention. The problem of retention is examined in Chapter III, with emphasis on the maintenance technician.

In Chapter IV, needed changes in the organizational structure of the Army are discussed, as these are required for the solution of other obstacles.

Potential benefits to the Army, should the implementation of a professional maintenance force be successful, are enormous. A discussion of some of these benefits is contained in Chapter V.

The concluding chapter, Chapter VI, contains a brief summary of conclusions reached in previous chapters. Also, some areas for further study and research are recommended.

CHAPTER II

LITERATURE SURVEY

Although VOLAR has been highly publicized and has generated a great deal of controversy and attention, there has been surprisingly little data published concerning it's overall benefits and effects on the modern Army. Effort thus far has been directed toward the more immediate problems of budgeting, planning, and the rapid creation of inducements for a larger number of volunteers, and needed changes to improve the image of the Army. There has also been considerable attention to the subject of whether or not VOLAR is even possible. It is almost certain the Army has many plans and long range objectives that remain classified, but due to the nature of this paper any classified data or information is purposely neglected. To the author's knowledge, there have been no published reports dealing with VOLAR as regards to maintenance. There have been, however, some reports dealing with VOLAR in general, and work within the Department of the Army is continuing.

Study PROVIDE (Project Volunteer in Defense of the Nation) has catalogued several hundred suggestions for change in the Army that might have some influence in making army life more attractive, and which presumably would increase the rate of volunteering for service (Lindsay, 1971). These suggestions were provided from personnel throughout the Army, but experimental verification of presumed results would be difficult. Ideally, from the standpoint of unambiguous measurement of effects,

it would be desirable to introduce these changes systematically into the military system and to evaluate their effects using experimental and control groups. However, such experimentation is very time consuming, so some shortcut is necessary in order to meet required deadlines for implementation of an all-volunteer force.

The Special Assistant for the Modern Volunteer Army (SAMVA) is addressing the problem of change with a twofold approach: by fostering many innovative changes at several field installations and making preliminary evaluations; and, by evaluating broad, generic changes objectively from the standpoint of their probable effects on attracting and holding acceptable personnel in military service. This approach is limited in scale and scope and is closely related to conditions at the installation at which the change takes place, hence caution must be used in attempting to generalize the results.

SAMVA and study PROVIDE conclude that of prime importance in the success of an all-volunteer army is the percieved job importance of individual soldiers and fulfillment of self esteem. A recent study of West Point graduates made to gather information on the importance that the graduates attach to various job characteristics tends to support this conclusion (Butler, 1971).

In the West Point study, the rank order of the relative importance which officers attach to job characteristics was investigated. Their rank order, from most to least important, for the more important ones were as follows:

1. Interesting work.
2. Chance for advancement.
3. Opportunity to realize one's maximum potential.

4. Participating in decisions involving own future.
5. Fair evaluation of performance.
6. Freedom to do a job in the best way.
7. Amount of personal responsibility.
8. Overall policies of the organization toward employees.
9. Opportunity to be a leader.
10. Pay.
11. Personal freedom in expression of opinions and individual behavior.
12. Lack of family separation.
13. Steady work.
14. Opportunity to develop as a well rounded individual.
15. Ability to use own major technical skills.
16. Opportunity to attend further formal civilian schooling.
17. Retirement plan.
18. Chance for training and learning on the job.
19. Good interpersonal relationships with peers.
20. Medical plan and other fringe benefits.
21. Highly respected job.
22. Good interpersonal relationships with superiors and subordinates.

The principal difference between the West Point study and a similar one directed toward enlisted personnel is that pay and the policies of the organization toward employees would probably be ranked nearer the top in the latter case. This difference would not be surprising considering the much lower relative pay scales of enlisted grades and the historical classification of enlisted grades as second class when compared to the

officer corps. Both of these differences are being eliminated or reduced with the implementation of VOLAR, and any studies made of the enlisted grades would not reflect these important changes. For this reason, the West Point study is pertinent to this paper, even though it was directed only toward the officer corps. Studies of this nature are usually directed toward officers, and there may be a tendancy to relate items such as those listed with officers only. However, as will be shown in Chapter III, this in not the case.

Another area that has been investigated and is an important basic consideration for this paper is the quality of volunteer enlistments. A summary of some of these reports is contained in a recent issue of Commanders Digest (Sept. 14, 1972). For Fiscal Year 1972, high school graduates accounted for seventy percent of enlistments, compared with sixty-seven percent the previous year. A favorable quality level of those who enlisted this past year has been demonstrated by their mental test scores. Table 1 on the following page shows the mental test scores of this year's volunteers, as compared to the nation's non-college population. In Table 1, the highest mental group is group one. An important factor not considered in these test scores is what effect the lack of a draft environment will have in the future.

There have been reports of an unclassified nature dealing with the budget costs of the volunteer Army (for example, Commanders Digest, Sept. 14, 1972, and Feb. 8, 1973; also Canby, 1970). These reports, however, fail to consider the cost savings of having a more professionalized army. Although there are substantial costs related to VOLAR, a large portion, if not all, of these costs would be offset by more efficient operations. Futhermore, there are insufficient data sources available in the Army

MENTAL GROUPS (AFQ TEST)		NON-COLLEGE POPULATION, AGE 19-21	ENLISTMENTS
ABOVE AVERAGE	I & II	25%	35%
AVERAGE	III	39%	48%
BELOW AVERAGE	IV	26%	17%
NOT ELIGIBLE	V	10%	0%
TOTAL		100%	100%

TABLE 1. Mental test scores of male enlistments, for FY 1972, compared to non-college population.

for evaluation of the true cost including any savings. For this reason, these existing reports were found to be of little value for use in this paper.

CHAPTER III

RETENTION

Since the inception of an all-volunteer army, there has been considerable effort devoted to the problem of personnel retention. This is justifiable, since the success of a professional volunteer army depends upon the retention of well trained, experienced personnel. Emphasis thus far has been in higher military pay scales, increased fringe benefits, and better off-duty living conditions. Reasons for forcing rapid changes in these areas stem a great deal from a study by the Cordiner Committee of incentives for a military career, which resulted in Congressional adoption of the Military Pay Act of 1958 (Falk, 1966). Subsequent pay acts have followed in recent years.

The Cordiner Committee report concluded that after an initial term of service, a person could expect higher net pay in a starting civilian position than he would receive in the military; that due to significant increases in fringe benefits for the private sector, the military no longer had an advantage in this area; that civilian personnel working side by side with military specialists received far better pay in remote geographical areas than their military counterparts; that opportunities for advancement in the officer and enlisted career fields were severely restricted and it was difficult for younger technicians to advance; and that military housing was sub-standard.

Significant improvements have been made in the military since the

Gorliner report. From a token allowance of $21 a month in the years of the second world war, the pay of the lowest enlisted man today is [illegible]. Coupled with the dramatic increase in military pay, there have been gains in the areas of race relations, quality of military recruiting, civilianizing military jobs previously used for harassment and "character building," and provision of better housing for officers, enlisted men, and their families. During the past four years, construction has included 34,830 family housing units, 122,185 barracks spaces, and 6,983 bachelor officers' quarters at a cost of over $1.5 billion (Commanders Digest, 1973). Despite these improvements, the rate of reenlistments continues to be a major problem. Although military base pay has increased by 42 percent since 1962, reenlistments have dropped 30 percent (Logistics Management Center, 1971). Vietnam is not considered to be the only cause of the lack of response to improvements in military life. Two famous concepts in human motivation help to explain the lack of response to the current methods of improvement; the first being Maslow's Need Hierarchy, and the second, Herzberg's Motivation-Hygiene Theory.

A motivational scheme well known to psychologists is that of A. H. Maslow published in 1954 (Crutchfield, 1969). He visualized five interrelated levels of needs, and stressed that a lower need must be satisfied before the next higher one could emerge. These five need hierarchys as Maslow perceived them are:

1. Psysiological Needs—needs for food, water, rest, exercise, and shelter.
2. Safety Needs--needs for protection against danger, threat, and deprivation. This includes a need for security in employment without favoritism, discrimination, or unpredic-

table superiors.

3. Social Needs--needs for belonging, for association, for acceptance by his fellows, for giving and receiving friendship and love.
4. Egoistic Needs--needs for self-confidence, independence, achievement, competence, knowledge, status, recognition, appreciation, and respect of his fellows.
5. Self-Fulfillment Needs--needs for realizing one's potentialities, for continued self-development, and for being creative.

An important fact must be considered in Maslow's need hierarchy when it is used in the analysis of human behavior. The fact that a particular level is satisfied is not an indicator of what a person's behavior will be. If a man is acutely hungry, the lack of food has a profound effect on his behavior. His hunger is thus a strong motivator. When his need for food is satisfied, this satisfied need is no longer an appreciable motivator of his behavior. Needs at the next level then begin to dominate his behavior.

Thus far, effort to improve military life has been directed toward meeting the first two levels of the need hierarchy. Obviously, the biggest advantage to the military complex would be the encouragement of the egoistic and self-fulfillment needs. Egoistic needs are of the greatest significance to the individual and the military, but do not appear in any noticable degree until physiological, safety, and social needs are reasonably satisfied. Formal social interaction, especially in the enlisted ranks is not given proper consideration for satisfaction . As a consequence, those in the lower enlisted ranks become resistant, antag-

onistic, and uncooperative. Egoistic needs are rarely fully satisfied, however, due to the lack of static goals in this area of human desire. Never the less, opportunities for at least partial satisfaction must be present. The opportunity for any measurable satisfaction for all low ranking enlisted personnel is lacking in the military structure of the present. The low rate of retention, in Maslow's concept is not the dissatisfaction as much as the absence of satisfaction of basic social and egoistic needs.

Correlation of Maslow's need hierarchy with the results of the West Point study mentioned in Chapter II is obvious. Lack of opportunity for satisfaction of the factors deemed important to the graduates is a prime cause of resignation after completion of a minimum tour of duty. Important to be remembered is that Maslow's need hierarchy is valid for all personnel in the Army, and not just for those in the officer ranks.

Lack of satisfaction, instead of dissatisfaction, as a cause of low retention rates is further substantiated in Herzberg's Motivation-Hygiene Theory (Nielander, 1969). Herzberg's motivational theory provides a reasonably accurate prediction of trends and effects of specific actions and policies directed toward the stimulation of personnel motivation. In his theory, Herzberg presumed that there is a dual nature in man's behavior: the animal need to avoid pain and a human need to grow psychologically. By experimentation with employee groups, Herzberg found employee attitudes fell into two broad categories. One concerned the environment in which the job was performed, such as working conditions, supervision, management policies, interpersonal relationships, effects on personal life, job security, and salary. This category was labeled "hygiene" factors, since employees' feelings of job dissatisfaction

seemed to be a consequence of low opportunities in these areas. The other category had to do with factors concerning the job itself, such as interest in the work, successful performance, due recognition, and advancement. This second category was thus labeled "motivators," as employees attributed their good feelings about the job and their principal incentives to superior performance to satisfaction of these factors.

Evidence supports Herzberg's conclusion that employees' attitudes do not follow a simple continuum from dissatisfaction to satisfaction. Dull work coupled with good working conditions is likely to make an employee lack enthusiasm for his job, but does not necessarily mean he will become actively dissatisfied with it. On the other hand, dissatisfaction due to poor working conditions can often be overcome with due recognition of superior performance and stimulating work. Deterioration of job satisfaction does not lead to job dissatisfaction, but simply a lack of satisfaction. Improvements in hygiene factors alone may reduce dissatisfaction but does not generate active satisfaction. Motivators provoke employees to greater effort and superior performance, but neither motivators nor hygiene factors considered alone can produce an employee entirely happy and effective in his work.

Hygiene factors provide a base on which motivating factors can build active job satisfaction, but their influence in producing satisfaction is either neutral or negative, but not positive. For this reason, the motivating factors are more important if active satisfaction is the goal. "Apparently," Herzberg concluded, "the feeling of growth in stature and responsibility is still the most exciting thing that can happen to someone in our society" (Byrnside, 1971). The Army, therefore, must give considerable attention to these motivating factors.

Correlation of the attitudes of military personnel with Herzberg's theory can be found in a Bureau of Naval Personnel report published in 1966 (Bymside, 1971). One purpose of the report, which in similar to the West Point study, was to ascertain the principal, common factors that influenced Navy officers in their decision to resign. Table 2 snows a listing of the reasons for resignation in a motivation-hygiene context. An important point that emerges from Table 2 is that nine out of the ten highest related factors fall within the motivator classification. The survey concerned itself entirely with officers, as, unfortunately, most surveys of this type do; however, it is not expected that a similar study of the enlisted ranks would yield significantly different results.

Both Maslow's Need Hierarchy and Herzberg's Motivation-Hygiene Theory support the same general conclusions as to the reason for the lack of response to current incentive programs initiated by the Congress and Department of Defense designed to increase retention. Lack of interest in the work, lack of due recognition and advancement, lack of independence in the work environment, lack of free association, and lack of continued self development are among the principal reasons for low retention, especially among the lower enlisted ranks. It is significant that the theories developed by Maslow and Herzberg are equally applicable for the lowest grade in the enlisted ranks. In recent years, civilian managers have demonstrated greater acceptance of the theories. The military has now begun to use the principles in the development of officers, but thus far application to enlisted men has been lacking. More general acceptance of these theories throughout all levels of the military hierarchy is necessary for increased retention.

An acute problem to the military is the retention of skilled, highly

MOTIVATORS
Achievement
*Challenge of Civilian competition
*Civilian opportunity
Recognition
*Lack of recognition
Work Itself
*Excessive sea duty
*Unsatisfactory superior officers
*Poor use of skills
*Restriction of self-expression
Work not worthwhile
Uninteresting duty
Demands of work
Growth and Advancement
*Limited possibility of promotion
*Slow rate of promotion
Lack of educational opportunities

HYGIENE
Working Conditions
Dislike of Navy
Desire to live in a particular area
Salary
*Insufficient pay
Inadequate housing
Status
Decrease in prestige
Security
Instability of Service career
Medical care
Reduced benefits

TABLE 2. Reasons for resignation in a motivation-hygiene context.

(*) indicates items most influential in decision to resign

trained maintenance technicians at all levels of repair echelons. The expense of a continual high turnover of maintenance personnel is an immense burden to the military. Of all formal technical training, between 80 and 90 percent consists of initial instruction given to enlisted personnel after completion of their basic military training. Although skilled positions account for less than half the enlisted strength, they require a much higher proportion of training costs, as those with the longest training time exhibit the lowest retention at the end of the first term of enlistment. Approximately half of the enlisted personnel are on their first enlistment, and a large number of the remaining half serve as instructors (Falk, 1966). Those engaged in training or instruction are not productive in the material sense.

The above figures reflect large expenditures required of the Department of Defense for continual training requirements, and indicate a poor cost to benefit ratio received directly by the military. Of course, there are considerable national assets that accrue from the military training effort, as it provides a wide technical base from which industry in the private sector can draw upon for manpower requirements. However, with the prevailing anti-military mood of the Congress, and the negative attitudes of large numbers of the new generation electorate, it is highly doubtful that the military can continue to support such as expensive training effort. More emphasis upon on the job training would relieve much of the pressure, and at the same time would provide greater opportunities for the motivational drives mentioned by Maslow and Herzberg. By using on the job training for first term enlistments, more persons would be on a productive basis, and higher training costs could be reserved for those expressing a desire for a military career. This

too would not go uncontested, as considerable opposition would likely develop if the outflow of skilled personnel from the Services were to be substantially curtailed.

The Army, as well as the other services, must find new, innovative programs to stimulate and motivate skilled maintenance technicians. Many of the changes needed to correct the problems of low retention and lack of satisfaction of the motivator type needs can be found in Maslow's and Herzberg's theories, although admittedly, the mechanisms of change will be complex and difficult to conceive and implement.

Standardization of work procedures is a source of many of the problems of motivation. Civilian industry, especially in the auto assembly line, have found that the youth of today will not tolerate a highly standardized work environment. Auto workers form one of the highest paid labor forces in the world, but are among the highest in turnover, absenteeism and dissatisfaction, and the quality of workmanship does not measure up to past standards. The auto industry has begun experimenting with alternate methods of production to relieve the boredom of the assembly worker, like the team assembly concept recently developed by Saab of Sweden. The consequences of high standardization that are now surfacing in the civilian sector are also being experienced by the military. Lack of interest, lack of recognition, lack of independence and lack of self development are among the results of high job standardization. The Army, in it's military job classifications (MOS) and maintenance task allocations, should permit greater flexibility, provide for a broader job base, and allow for more varied job experiences and development of skills outside the classroom. Allowing the maintenance technician the discretion of repair based on his own percieved ability would result in providing

greater responsibilities, recognition, self development, and job enlargement.

Assignment of personnel outside their skill specialties is a recurring source of personnel dissatisfaction and resentment. This problem is not, however, completely the fault of the military. Congressional attitude and actions have historicly emphasized the placement, whenever possible, of civilian workers in military job authorizations, and as a result, many military maintenance personnel returning from overseas do not have an available slot in the continental United States. As a specific example, Hawk and Hercules missile maintenance personnel returning to the continental United States have a very limited assignment potential due to civilianization of their slots, with the principal remaining opportunities being in the recruiting or teaching areas (Moss, 1965). They do have another choice; they can elect to leave the military and accept a civilian job in their area of interest, which, unfortunately, many choose to do. One civilian organization reported that 90 percent of their approximately 15,000 field representatives were from the military services (Moss, 1965). If an all volunteer army is to succeed, the practice of civilianization must be revised, because a professional military maintenance force is essential for the support of a professional volunteer military force. Another complication resulting from heavy civilianization is the reduction in opportunities for advancement, particularly for maintenance technicians.

Opportunities for advancement, especially for enlisted maintenance personnel, is another principal source of poor motivation. After completion of initial training in a specific skill area, maintenance personnel usually progress to the rank of E-4 in the specialist grades rather eas-

ily. Those in higher skill levels such as electronics or missile maintenance often receive initial assignment to an E-5 organizational slot. However, opportunities for advancement beyond E-6 is very limited, and due to the rigid separation between officer and enlisted ranks, chances for assignment to a position of high responsibility and challenge is practically nonexistent. Those in the officer ranks experience similar difficulties if the inherent ambition is to remain in the maintenance environment.

Personnel who wish to specialize in maintenance find promotional opportunities beyond one or two grades restricted due to the lack of an existing rank structure designed for maintenance support personnel, and tailored to allow for maintenance managers in the higher rank structure. Since maintenance slots are often assigned within operational army units, higher ranks are usually reserved for command personnel. The situation is synonymous with maintenance personnel in civilian industry being viewed as overhead, and higher responsibility positions being reserved for those engaged in production. An imaginative solution to the problem of advancement potential for maintenance personnel would be the establishment of an Army Maintenance Corps, which would have it's own rank structure and be responsible for all army owned equipment maintenance and related support.

Recognition of the motivational type factors in human behavior, put forth by Maslow and Herzberg, will result in many new innovations directed toward both officer and enlisted ranks. However, a major obstacle to overcome in the implementation of these new programs is the hierarchial structure of the armed forces. Programs developed to improve the motivating factors discussed above may well be in direct conflict with

command policy. For this reason, organizational change in the services, sometimes drastic, seems inevitable. A discussion of organizational structure, and needed change, is presented in Chapter IV of this report.

CHAPTER IV

ORGANIZATIONAL POLICIES

Probably one of the most dramatic changes in human behavior has occured within the last decade; individuals of every description are driving for more influence and participation in organizations and programs that affect their lives. People today refuse to follow like sheep to the whims of those in power, they demand participation. The oldest autocratic structure in the world, the Roman Catholic Church, has used a rigid authoritarian form of governance for hundreds of years, with only minor internal resistance, but is now facing strong resistance and worldwide demands for a more responsive, participative form of organization. In the ghetto, poverty stricken, poorly educated blacks refuse the guidance of the expert sociologist and insist on more control over their own lives. These trends in behavior are a direct result of rapid advances in technology the last three decades, which have resulted in substantial increases in communication and public awareness. The Army, as well as the other services, will not escape similar increased internal resistance, unless innovative changes in the organizational structure takes place that will allow more participation on the part of lower ranking officer and enlisted personnel.

To a degree, the formal organizational structure of an organization is determined by the way higher management percieves the man at the bottom. Unfortunately, the Army's organizational structure, as viewed from

the bottom, was concieved with what is now outdated and incorrect ideas of the nature of the worker (low ranking personnel in military), but due to the size and complexity of the Army, any significant change will be difficult and time consuming. However difficult, change can, indeed must, take place. Many new innovative managerial theories have surfaced in the past several years, perhaps the most famous and of greatest impact being that proposed by Douglas McGregor (1960). McGregor's theory as to the relationship between management and the worker is well known as "Theory X" and "Theory Y."

In the older, more conventional form of organization structure, McGregor develops the management-worker relationship as Theory X, which he describes as:

1. Management is responsible for organizing the elements of productive enterprise--money, materials, equipment, people, in the interest of economic ends.
2. With respect to people, this is a process of directing their efforts, motivating them, controlling their actions, modifying their behavior to fit the needs of the organization.
3. Without this active intervention by management, people would be passive, even resistant, to organizational needs. They must therefore be persuaded, rewarded, punished, controlled, their activities must be directed. This is management's task. It can be summed up by saying that management consists of getting things done through people.
4. The average man is by nature indolent, he works as little as possible.
5. He lacks ambition, dislikes responsibility, prefers to be

led rather than be the leader.

6. He is inherently self-centered, indifferent to organizational needs.
7. He is by nature resistant to change.
8. He is gullible, not very bright, the ready dupe of the charlatan, and the demagogue.

The Theory X perception of the worker can be recognized as the basic premise supporting the conventional, authoritarian form of organizational structure. It is perhaps amazing, and at the same time regrettable, that while Theory X reads like a description of the way not to view the worker, it is the way the lowly private was portrayed many years ago. Some television flicks and the widely known movie accounts of GI Joe add to the Theory X perception of the enlisted man. There is no insinuation meant that Theory X is an account of the general opinions of high ranking officers today. However, it is true that Theory X represents a cross section of views held during the time of the world wars, and too many of the organizational principles resulting from such views still linger in the military, particularly in the case of the enlisted ranks. It must also be mentioned that the Theory X principle was not entirely incorrect a great many years ago. The infantryman forced into servitude in the Army as a result of the draft in peacetime would quite naturally have some negative attitudes. Also, those well educated and with a willingness to serve in the military usually choose to serve in the other Services, due to the esteem of the other Services compared to the Army. The Army, as a result, experienced difficulty in recruiting capable personnel to fill technical positions. Futhermore, the draft was viewed as the only way the Army could enlist needed personnel, rather than the result of the

Army's sheer size.

Persons entering the military during the time of the world wars did not find application of Theory X highly objectionable, as most organizational structures in the civilian sector were not notably different. However, the resulting complacency and performance of personnel treated as though Theory X is correct today cannot be tolerated if an all-volunteer army is to succeed. If people are deprived of opportunities to satisfy needs which are important to them at work, their behavior will be predictable; they will be indolent, passive, resistant to change, lack responsibility, and seek fulfillment of their needs outside the work environment, thereby placing the job in a secondary position. In other words, if a person is treated as though Theory X were correct, it probably will be. For these reasons, among others, McGregor proposed a new theory of management-worker relations, which he called "Theory Y". A description of McGregor's Theory Y is given below.

1. Management is responsible for organizing the elements of productive enterprise--money, materials, equipment, people, in the interest of economic ends.
2. People are not by nature passive or resistant to organizational needs. They have become so as a result of experience in organizations.
3. The motivation, the potential for development, the capacity for assuming responsibility, the readiness to direct behavior toward organizational goals are all present in people. Management does not put them there. It is a responsibility of management to make it possible for people to recognize and develop these human characteristics for them-

selves.

4. The essential task of management is to arrange organizational conditions and methods of operation so that people can achieve their own goals best by directing their own efforts toward organizational objectives.

McGregor emphasizes Theory Y does not mean the relinquishment of management, the absence of leadership, the removal of standards, or other characteristics associated with Theory X. It does, however, imply "management by objectives" rather than "management by control." Mcgregor sees Theory Y as the creation of opportunities, providing the means of releasing human potential, the removal of obstacles, the encouragement of growth, and as providing guidance.

Although full application of Theory Y is not expected in the foreseeable future, management in industrial organizations has recently made some attempts in application of varying degrees of the theory. The military has also experienced some incorporation of the theory into officer ranks, although there has been a lack of deployment into the enlisted ranks. Whatever the degree of acceptance today, continued pressures and solicitation for more worker participation, influence, and control will require more widespread use of Theory Y in determining the structure of future organizations.

Some management theorists envision the continued evolution of corporate structure toward a utopia of industrial democracy (Rice, 1971). Rice imagines the process as moving along a continuum bounded by two extremes, with the order of evolution starting with autocracy, followed by bureaucracy, systems, decentralization, collegialism, federation, and finally egalitarianism. Extension of this particular concept to the

general Army structure is limited, but from the standpoint of the technical nature of maintenance, some similarity of change is possible, and should be encouraged. Also, it does present a pattern for the future organizational changes within the Army that can be expected.

From Autocracy to Bureaucracy

Autocracy, the simplest and most primitive of organizational forms, has as it's basis conformance and obedience; the relationship between worker and superior resembling that of master and slave. It is the pure form of Theory X as the managing principle. Because of the size of the Army, autocracy has never been the general organizational structure, although it probably was used in immediate superior-subordinate relationships within the general Army structure, and in some cases may even exist today. This form of organization is still evident in small corporations, but as corporate size increases beyond the capabilities of the master, and the knowledge of the master fails to keep pace, autocracy gives way to bureaucracy. Autocracy is a most inefficient form of management, as it degrades subordinates, and the limits of the organization are the same as those of the superior.

Bureaucracy, the most common form of organization today, accommodates large organizational size, and makes use of knowledge other than that of the superior. It is the superior's office that is in perpetual command, and the superior directs his subordinates by setting policies instead of personal, verbal commands. Bureaucracy is an organization of offices and departments rather than people, and allows for a smooth transition of power and promotes specialization. Due to the need for smooth transition of top management personnel, the federal government is organized as a bureaucracy, which is most noticeable in the executive and the

congressional branches. Because the Army is directed by a bureaucracy, and due to the size and practice of rotating key management personnel, the Army is also a bureaucratic organization, although there has been some movement to systems management. In the case of maintenance, policy is established as to the echelon in which each type of maintenance action will be performed for a particular piece of equipment. Little discretion is left to the specialist working in a certain echelon as to the extent of maintenance he will perform, regardless of his particular ability or interest, as it is his MOS that is the guiding factor. Bureaucracy is the type of organizational structure the current resistance is directed toward, due to the dehumanizing form it takes.

From Bureaucracy to Systems

The principal weakness of a bureaucracy is that once policy is established, it is very difficult to change, hence cannot adapt readily to technological change. It remains static in an environment which is in a constant state of flux; the organization is a series of compartments, each remaining static. Another problem in a bureaucracy, quite evident in government, is the inability to solve unforeseen problems without addition of another office or bureau. The bureaucracy becomes a monster.

A systems approach to management views the organization as a whole, and emphasizes interdependence of the components and their interaction to solve both internal and external environmental problems. The systems approach is very new and still much in the development stage, but provides for rapid adjustment to problems. Procurement practices currently being initiated in the Army are good examples of system management. Participation of low ranking personnel is not particularly advanced by the systems approach, although higher management tends to move closer to

those at the lower extremes of the organization. An important requirement for a systems type organizational structure is a good, reliable, general purpose data collection system and information bank. Although the Army does have many data collection devices, they are fragmented and tend to serve specific purposes. It is not probable that funds will be available in the immediate future for creation of a general system since the cost would be great, due to the size of the Army. For this reason, general use of systems management within the Army is unlikely.

From Systems to Decentralization

Decentralization recognizes the human element in the organization, especially at the lower end of the organizational structure. The primary reason for this shift is the specialization of labor. If the overall objectives and responsibilities of the organization cannot be broken into fairly routine tasks, expert judgments of professionals rather than disciplined compliance with the commands of superiors must govern operations in the interest of efficiency. In the highly skilled labor force of today, it is the skilled worker at the bottom of the organizational structure that is the critical link in the success of operations, for it is he who makes the most crucial day-to-day decisions. In recognition of this fact, decentralization is aimed at satisfying the motives and social needs of the subordinate and allows him to participate in the direction and decisions that affect his work environment. This is the shift taking place in industry today, and represents substantial increase in the acceptance of Theory Y. As a result, the decision-making arm of the organization is being pushed lower on the corporate structure. Continued shift toward decentralization is inevitable. When a manager makes a decision his superior does not agree upon, the superior may not think

twice about revising it; however, if an electronic engineer or highly skilled technician makes a decision, the manager would be reluctant to intervene.

It is doubtful the military can achieve the degree of decentralization possible in industry, but more extensive use of this principle is possible and would be of benefit. President Nixon's present program of decentralization of federal government, in order to have more responsive programs, may well influence similar efforts in the military. Although major policies and plans should be reserved for high staff officers, decentralization would result in more responsibility and flexibility given to the lower ranking personnel, and would result in more efficient management of the complex weapons systems of today. In the case of the maintenance technician, he would be given more latitude in the exercise of his duties.

Two recent events support the theory that decentralization in the military is not only possible, but highly desirable; the Six-Day War of the Middle East, and Vietnam. The success of the Israeli military forces is due to an organizational structure that emphasizes decentralization, and incorporation of the modern trends in personnel and weapons systems. Defense Minister Moshe Dayan explained that while an Arab officer had to clear every decision through his superiors, the Israeli officers handled situations on their own initiative; that while the Arab officer was waiting for the solution to a situation from his headquarters, the situation had changed completely. Although the Israeli Army is the most effective military force in the world, it's headquarters must call the company commander to find out what is going on. The staff officers are left to more general plans and objectives.

The combat infantry of the Marines and US Army were forced to place more decision responsibility and influence in the lowest ranks as a result of experience in Vietnam. Due to the rapidly changing combat situations, it was not possible for squad leaders to adhere to previously concieved plans, or await instruction from higher authority. It is important to point out that success in the Middle East and Vietnam was largely due to decentralization of authority and participative style command structures, even though the two wars were very different in the type of combat encountered.

The infantry command of the Army, as a result of lessons learned in Vietnam and the exceptional effectiveness of the Israeli Army, will probably continue to stress decentralization of combat forces. However, the maintenance technician is still required to look in a manual to find out if he is allowed to attempt a corrective maintenance action. Decentralization of the entire Army structure is necessary for the achievement of an all-volunteer army. New enlistees will continue to resist a strong authoritative organizational structure, so the organizational structure must decentralize because of necessity. Furthermore, the capability and performance of modern weapon systems rely on too few personnel in an authoritative or bureaucratic organization, and flexibility is decreased.

From Decentralization to Collegialism

Collegial organizational structures will emphasize research, professionalism, and education. In the case of industry, as professionalism moves lower and lower on the corporate structure, the organizational form will shift toward this model. Instead of directing the subordinate, the superior will consult him. Management will become more concerned with utilizing the skills of the subordinate and with providing him a more

stimulating work environment. The shift is also due to increasing demands for innovative ideas, new product lines, and new knowledge. Due to the immense complexity of some weapons systems, some incorporation of collegialism is expected to be necessary, especially in the maintenance of these systems.

From Collegialism to Federations

As professionalism and specialization of labor become more clearly defined, the implications are that the specialists in the civilian sector will band together in their activities and form their own organizations, and offer their services to all. An example of this can be seen in the medical profession, as more and more specialists are breaking off into separate groups. Further examples are found in the establishment of law firms, accounting firms, and engineering firms. Federations will become a modular version of society. Creation of a seperate maintenance corps in the Army is another possible example. Even more fanciful, consider the creation of a modular maintenance corps responsible for the equipment maintenance of all the military services.

From Federations to Egalitarianism

The ultimate effect of collegialism and automation will be the organizational form of egalitarianism, with it's critical factor being interdependency. Each person in the organization depends on all others for his own success, and social expectations guide behavior rather than formal supervisors. Egalitarianism is industrial democracy in the purest form. Considering the inherent purpose of the armed forces, any future organizational structure in the Army will most likely incorporate only very little use of this form. However, as decentralization and manage-

ment theory develop further, sufficient information may be formulated to allow wider use of egalitarianism in the armed forces.

Organizational forms mentioned above are not shifts from black to white, as there are wide gray areas in the continuum. The optimum organizational structure for the Army may well employ several of the different forms. The most immediate change needed appears to be decentralization, as this form tends to provide opportunities for satisfying the very important motivating factors discussed in Chapter III, and would result in wider use of the Theory Y management principle. It would also go a long way in satisfying the current demand for more participation and influence for those at the bottom of the organizational structure. One of the most important driving forces for change, however, will continue to be rapid technological development and specialization of labor.

Drastic change in the Army structure will not be made without resistance. Attempts to develop participative decision-making machinery in formal organizations with hierarchical structures are almost sure to be frustrated by built-in conflicts of interest between those at the top and those at the bottom. Congressional resistance may also be considerable, due to fears of a military elite, and various other vested interests. Change is, however, crucial to the development of a professional volunteer army.

Even if the volunteer army was not under consideration, the practice of attempting to manage an army using the modern weapons technology of today, with many organizational practices dating back before the development of the atom bomb is questionable. The pace of world-wide development of technology is alone enough to force organizational change.

Benefits to the Army in development of a modern, efficient organ-

izational structure, with emphasis upon Theory Y and allowing for the satisfaction of motivational factors discussed in Chapter III are potentially enormous. Some of these, from the standpoint of maintenance, are discussed in the following chapter.

CHAPTER V

BENEFITS OF A PROFESSIONAL MAINTENANCE FORCE

From the two preceeding chapters, two key principles were developed. If the Army is to succeed in solving the serious problem of retention of skilled personnel, opportunities for satisfaction of motivational type factors must be provided. The second major point developed was that decentralization of the Army command structure is necessary for providing motivational opportunities, and for meeting demands placed upon the Army by modern weapons technology. Assuming the Army is successful in overcoming these obstacles, and creation of a professional maintenance force is realized, there are a great many benefits that would be forthcoming.

As mentioned previously in Chapter III, the costs of supporting present training requirements are enormous. If substantial cuts in this expenditure were realized, this benefit alone could justify any additional funds required for the creation of a professional maintenance corp. In 1964 the Department of the Army estimated that if only 60 percent of the men in the Army had ten years of service instead of less than three years, the yearly training load could have been reduced from 25[illegible],000 to approximately 70,000. Also, the existance of a plentiful supply of experienced maintenance technicians in a peacetime volunteer army could supply contingencies in the case of a large scale military involvement, such as Vietnam. This would seem to be a necessity, as it is unlikely that

volunteers would supply needed manpower requirements in the event of such an involvement; therefore, the ability for rapid increase in training facilities is required. In other words, there would be less need for an extensive training base in peacetime, but the capability would exist to rapidly expand into one.

If maintenance personnel in all repair echelon levels gain further experience and proficiency in equipment maintenance, more fundamental results of the learning curve theory would also be realized. Basic theory of the learning curve, and it's application to equipment maintenance, can be found in a paper written by Myron Wilson (1966). In his paper, Wilson urges the Army to allow use of the curve for predicting lower maintenance times than those demonstrated during a maintainability demonstration. His argument is that the validity of learning curves has been demonstrated widely in industrial maintenance activities, thus should be used to extrapolate lower maintenance downtimes than actually demonstrated in the tests of newly developed systems. However, the major weakness of this argument is that, unlike industry, the military experiences high turnover of it's lower echelon maintenance personnel, therefore high proficiency is never attained in the general case. Futhermore, civilian maintenance people work with the same equipment for long periods of time, but the Army maintenance man is not afforded this opportunity, due to a wide variance in equipment types and the practice of rotating assignments. Lastly, the inflexible echelon system and bureaucratic structure presently facing the military technician are not conducive to those motivational factors that produce the desire to do a job not only better, but also as fast as possible.

Decentralization of command structure, improved opportunities for

satisfaction of motivating factors, and a highly flexible echelon system would remove most of the obstacles to application of the learning curve in the Army maintenance system. Higher proficiency and experience in equipment maintenance, resulting from a professional maintenance force, would provide large dividends to the Army from results of learning. Mean time to repair could be reduced as much as 90 percent or more, as can be seen from an illustration of learning curve theory applied to maintenance time shown in Figure 1, where initial time to repair has been normalized to one (Wilson, 1966). Better attitudes on the part of maintenance technicians would also be evident, resulting in fewer mistakes, higher quality of work, and more personal initiative. Maintenance personnel would begin to view military equipment as "his equipment" instead of "the Army's." However, there is no suggestion here that the Army adopt Wilson's argument. In the case of large scale military conflict, equipment may still be maintained in the lowest echelons by incompetent, unconcerned personnel, but must be available for use when needed.

Potentially of most benefit to the Army would be the increased availability of weapons systems. Inherent Availability (A_i), expressed as a function of mean time between failure (MTBF) and mean time to repair (MTTR), is beyond the control of design engineers once equipment is fielded, for all practical purposes, since any change at this stage is usually very costly. Inherent Availability may be expressed as

$$(A_i) = \frac{1}{1 + \frac{MTTR}{MTBF}} \qquad \text{(Equation 1).}$$

Although the manner in which the system is used (or abused) may

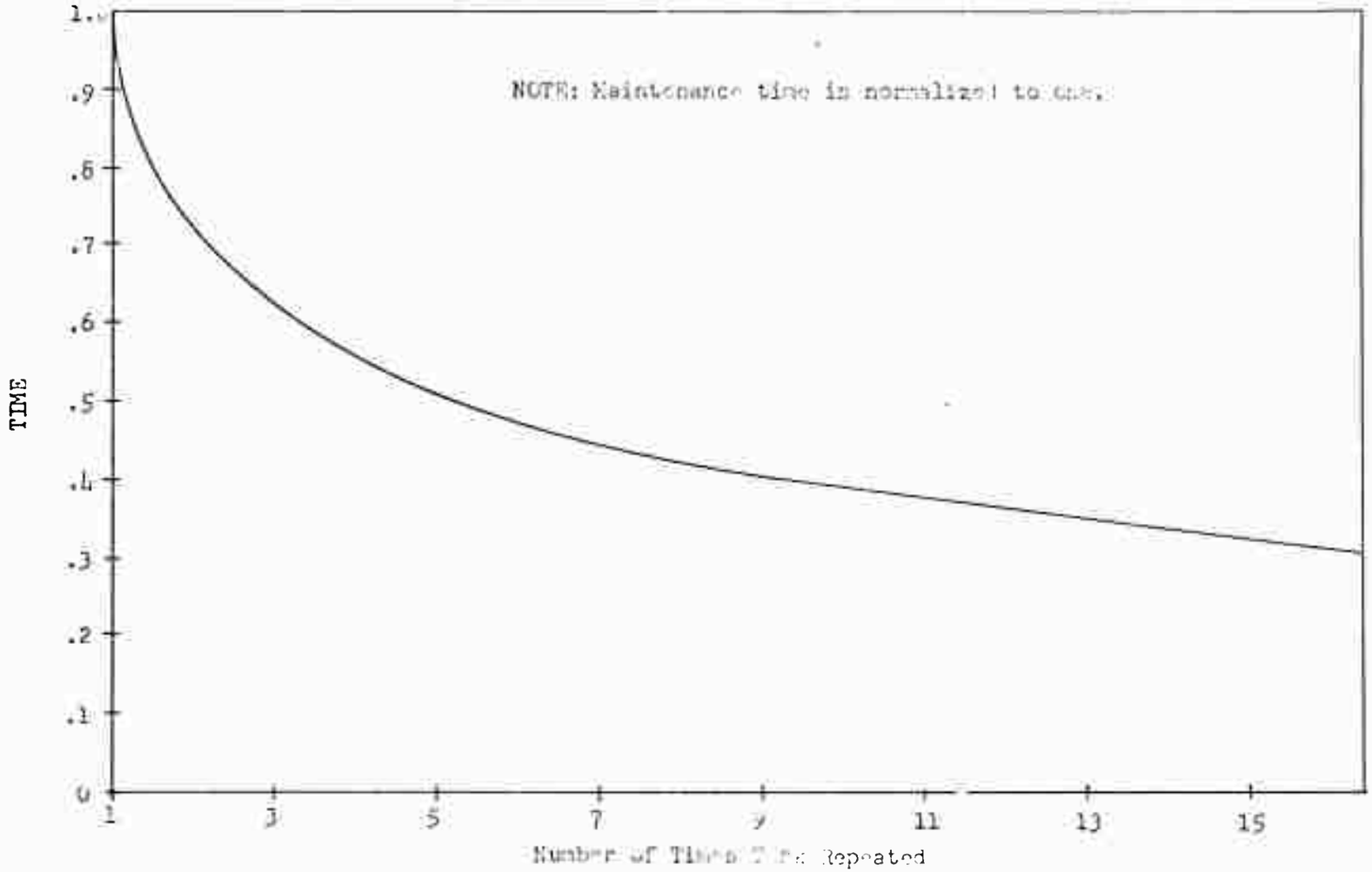

FIGURE 1. LEARNING CURVE APPLIED TO MAINTENANCE TASK TIME.

influence availability through mean time to failure, the maintenance technician has by far the greatest potential influence. An example of the effect of mean time to repair can be seen in Figure 2. Data for Figure 2 was developed by assuming an initial value of .90 for A_i, holding MTBF constant, and varying the percent decrease in MTTR. The maintenance technician also has substantial influence over MTBF, although not shown in Figure 2, as it is affected by quality of maintenance work performed.

Other measures of system availability would be affected in a manner similar to inherent availability. For example, achieved availability, which includes logistics time, administrative downtime, and active preventive maintenance time, could be increased by reductions in all categories of downtime. Both preventive and corrective maintenance times could be reduced, and decentralization would reduce administrative downtime. Logistics time could also be reduced by a more flexible echelon system allowing the possibility of more maintenance action in the lower echelons, which in turn would reduce transportation time. Similar advantageous returns would be offered in other parameters, such as operational readiness, system effectiveness, operational hours per maintenance hour and operational availability.

The more obvious benefits from a professional maintenance force can be related to reductions in cost of maintenance. However, there would also be returns less obvious, and less tangible. Knowing of the existence of professional maintenance personnel at all echelon levels, the maintainability engineer would have greater flexibility and use of the human element in his design for maintainability. This would relate to items such as less reliance on built-in test equipment, more general

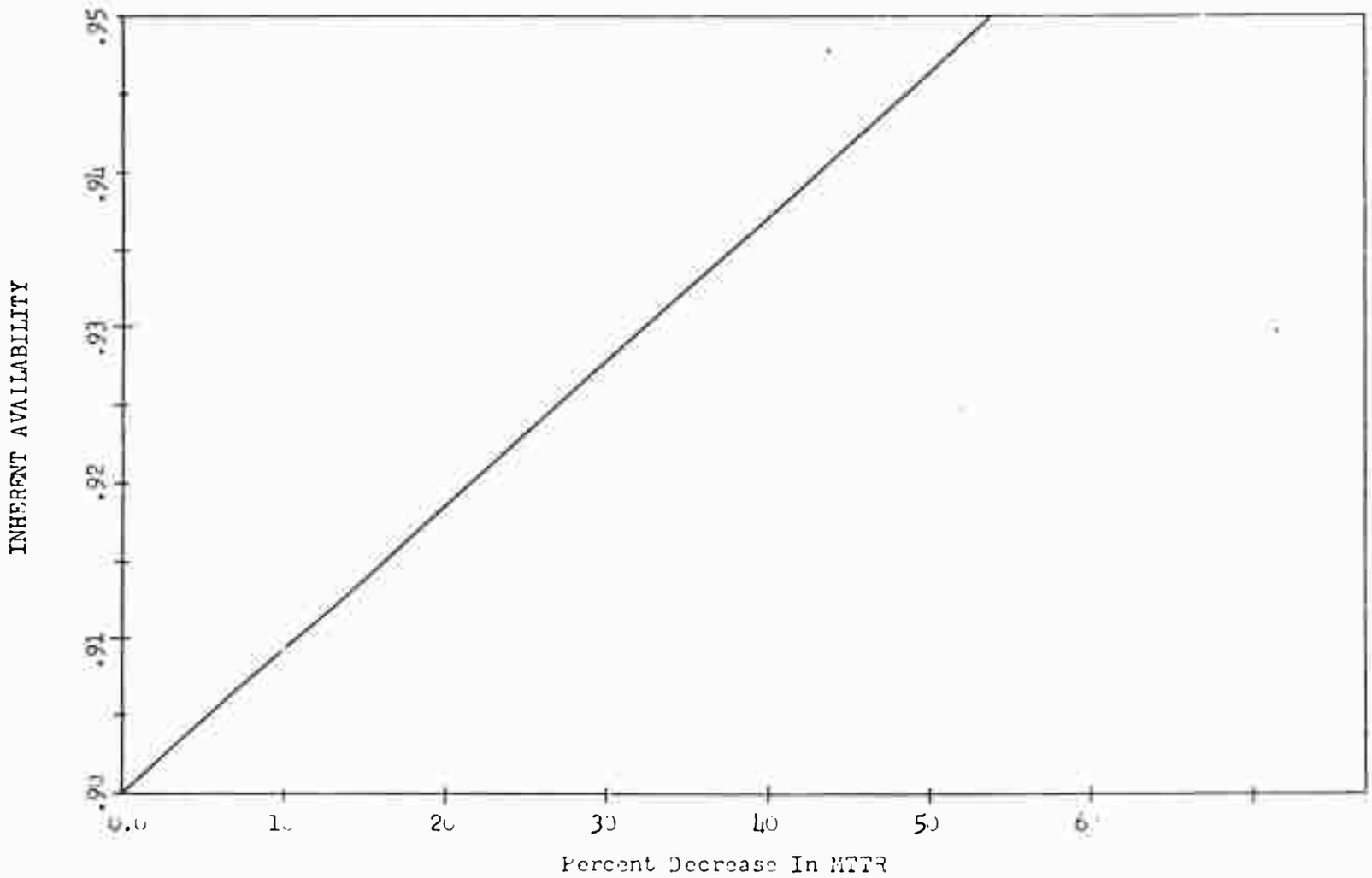

FIGURE 2. Effect of MTTR on Inherent Availability.

types of auxillary test equipment, less reliance on "cookbook" type maintenance tasks, and feedback of maintenance problems and suggested changes could be expected to be of better quality and possibly more numerous.

As military maintenance times and procedures begin to resemble more closely similar civilian practices, tests such as the maintainability demonstration could be performed with greater acceptability for both the Army and the contractor. Differences between army and civilian maintenance policies are a source of confusion and dissatisfaction in such tests. [illegible] tifiable, but correlation of test times with these maintenance times expected from user units could be achieved with less difficulty and differences of opinion. Staffing of test teams could also be done with less difference of opinion, as the requirements of the Army would be closer to expectations of the contractor.

Realization of benefits such as those discussed above will require sweeping changes in the Army's maintenance policies and organizational structure. Before these changes can take place, detailed studies will have to be initiated. Recommendations for areas of further study and research are contained in the following chapter. Also, a brief summary of conclusions reached within this paper is presented.

CHAPTER VI

RECOMMENDATIONS AND CONCLUSION

If the Army, with full cooperation of the congressional and executive branches of government, is serious in it's attempt to build a volunteer army with professional expertise, many drastic changes will inevitably occur in personnel policies and organizational structure. Of principal importance, and demanding the most immediate solution, is the problem concerning retention of highly trained technicians. In this paper, using basic principles of management and psychology, several conclusions as to needed improvements were developed, primarily from the viewpoint of the enlisted maintenance technician.

From Maslow's Need Hierarchy and Herzberg's Motivation-Hygiene Theory, it was concluded that more attention must be focused toward providing opportunities for satisfaction of motivator type psychological needs. While good opportunity for satisfaction of the lower physical needs, such as higher pay and greater fringe benefits, may induce civilians into a first enlistment, it does not necessarily lead to acceptable retention rates. Particularly from the viewpoint of the lower ranking enlisted personnel, increased retention of superior maintenance technicians must be preceeded by improvements in the work environment. This requires, among other things, creation of more interest in the work performed, swift and proper recognition of superior performance, more independence in the job, creation of an atmosphere of free association, and

ample opportunities for self-development.

In order to provide opportunities for satisfaction of motivator type needs, the superior-subordinate relationship within the Army must be more acceptable to low ranking personnel. McGregor's "Theory Y" of management-worker relations should receive a greater degree of application. A person's first supervisor probably has the greatest impact on his decision for reenlistment following initial enlistment. Therefore, it is imperative that all ranking personnel exhibit perception of the subordinate that affords him respect and courtesy. If the superior views the subordinate as lazy, ignorant, ambitionless, and indifferent, and thus tries to outwardly control him, the subordinate will in all probability fulfill the superior's expectations. An enlisted man in no less a man than an officer, and should be treated as such.

General trends in human behavior have recently demonstrated demands for more participation and influence in organizations that affect a person's life. The work environment is receiving large degrees of such demand. The existing hierarchical structure in the military is destined to be in direct conflict with these demands for participation; therefore, decentralization of authority and the dismantlement of the present bureaucratic structure is necessary.

Decentralization is necessary not only because of demand for participation, but also because implementation of programs to provide opportunities for satisfaction of motivator type needs would be very difficult under the present organizational policies. Command structure must become more flexible, and sensitive to needs of the lowest ranking personnel. In terms of maintenance, this means a more flexible echelon system, more decision responsibility for low ranking personnel, and increased job

involvement in all repair echelons. The Army is competing with civilian industry for skilled technicians, so must approximate as closely as possible the trend toward decentralization presently being observed in the private sector. In preceding chapters, several suggestions were offered for decentralization of organizational structure, and fulfillment of motivational needs of maintenance personnel.

Of prime consideration in the decentralization of authority is the need for a reliable, easily accessible information and communications system. As lower ranking personnel gain more responsibility and decision authority, precise information must be available when and where needed. Consolidation of existing data collection and distribution systems will be necessary. Bureaucratic red tape must be removed where possible for faster, more efficient communications links. Intense research is required for the development of usable data systems that will serve wider, less specific purposes, and offer accessibility to middle managers.

Civilianization of military maintenance positions deserves detailed study and revision. Not only does this practice take maintenance slots from army maintenance personnel needing assignment within the continental United States, but it also limits opportunities of advancement for army technicians. Futhermore, civilian personnel do not have the mobility of their military counterparts, a problem encountered by the Army during the rapid buildup of Vietnam support requirements. The Department of the Army, as a result of Vietnam, is considering the problem, but further study is required as to the effects on advancement and rotational assignments.

It was previously suggested the Army consider the creation of a separate maintenance corps, with its own command structure. This would tend

to professionalize maintenance by bringing all maintenance personnel under the same roof, and would remove some of the conflict encountered by low ranking personnel assigned to operational units. A person who volunteers for an infantry or combat unit has different psychological drives than one who enlists in a maintenance unit. The organizational structures of combat units and maintenance units may have to be different for satisfaction of personnel, which would be possible if a separate maintenance corps were established. Also, this would help solve the problem of advancement. Less rigid separation between enlisted and officer ranks would enable enlisted personnel who demonstrate unusual ability to become managers. Distinction of maintenance officers, such as Warrant Officer, would keep maintenance managers where they belong, in maintenance. Considerable study is needed in these areas, to say the least.

Present army maintenance echelons should be more flexible. Not all equipment is best served by four distinct echelons. A maintenance technician should be allowed some decision authority to determine his own ability to make corrective repairs, with due consideration for available tools and test equipment. A more flexible echelon system would permit maintenance units with less experience to send equipment to a higher level, whereas those units with more experience may be capable of making the necessary repairs themselves. Also, equipment requiring only limited special support hardware may be best served by two echelons, but if highly specialized support equipment is required, four echelons may be appropriate.

Organizational units should be responsible for normal upkeep of equipment, such as routine lubrication, cleaning and minor repairs. If

a wheeled vehicle mechanic, after receiving eight weeks or more training, finds himself changing tires and applying "spit and polish" to vehicles and little else, the probability of his reenlistment could be predicted with good accuracy. Maintenance personnel should be assigned to maintenance units where they would have better chance of applying their skills and education.

Mobile maintenance units can serve organizational units as the need arises. This concept is currently receiving more attention from the Department of the Army. In some cases, it would be much more reasonable, and less expensive, to send maintenance crews to the equipment, rather than the opposite.

As can be seen, there are many areas of further study needed. Innovative ideas are needed to replace outdated and costly practices. Who knows, maybe the idea of converting mothballed Navy aircraft carriers into highly mobile depot level repair and rebuild facilities is not all that fanciful. In any case, creation of a professional maintenance force is needed, and of prime importance is the perception of the typical maintenance technician. It has been said (source unknown) that if you treat a man as you think he is, that will be his highest achievement, but if you treat him as you wish he were, his potential is unlimited.

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